

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) **McGuire Nuclear Station - Unit 1** DOCKET NUMBER (2) **0 5 0 0 0 3 6 1 9** PAGE (3) **1 OF 0 4**

TITLE (4) **Operation in Mode 2 With Both Trains of Chemical and Volume Control System in a Degraded Condition**

EVENT DATE (5)			LE NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)			
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)		
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OPERATING MODE (9) **2** THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

20.402(b)	20.406(c)	50.73(a)(2)(iv)	73.71(b)
20.406(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.406(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.406(a)(1)(iii)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(A)	
20.406(a)(1)(iv)	50.73(a)(2)(ix)	50.73(a)(2)(viii)(B)	
20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME **Julio G. Torre, Licensing** TELEPHONE NUMBER **7 0 4 3 1 7 1 3 1 - 1 8 1 0 1 7 1 9**

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS
X	CIB	11210	R131718	YES					
X	CIB	11210	R131718	YES					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On November 2, 1985, Unit 1 and Unit 2 tripped on low-low steam generator (S/G) level signals resulting from a ruptured instrument air line (LER 369/85-34). During this transient, the motor operators for two valves which allow the Chemical and Volume Control (NV) [EIIIS:CB] pumps to take suction from the Refueling Water Storage Tank (RWST) when in the closed position or from the Volume Control Tank (VCT) when in the opened position - burned up in the closed position and had to be manually opened. After discussion and review of Technical Specifications, Duke Power management decided that unit startup could continue. Unit 1 entered Mode 2 at 0615 on November 3, 1985. This action violated Technical Specifications (T.S.) 3.0.3, 3.0.4, 3.1.2.1, and 3.5.2. The unit was returned to Mode 3 at 1255 of the same day due to a secondary side leak. Both valves were repaired and determined operable on November 4, 1985.

Unit 1 was in Mode 1 at 100% power at the time of the discovery of the Technical Specifications violation on January 15, 1986.

This incident is attributed to Personnel Error, because Duke Power Personnel determined that no Technical Specifications would be violated before the decision to startup was made. No incidents occurred which required the automatic closure of these two valves while the subject motor operators were inoperable.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) McGuire Nuclear Station - Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 6 9 8 6	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		- 0	0 3	- 0	0 0	2

TEXT (If more space is required, use additional NRC Form 368A's) (17)

On November 2, 1985, Unit 1 and Unit 2 tripped on low-low steam generator (S/G) level signals resulting from a ruptured instrument air line (LER 369/85-34). During this transient, the motor operators for two valves - which allow the Chemical and Volume Control (NV) [EISS:CB] pumps to take suction from the Refueling Water Storage Tank (RWST) when in the closed position or from the Volume Control Tank (VCT) when in the opened position - burned up in the closed position and had to be manually opened. After discussion and review of Technical Specifications, Duke Power management decided that unit startup could continue. Unit 1 entered Mode 2 at 0615 on November 3, 1985. This action violated Technical Specifications (T.S.) 3.0.3, 3.0.4, 3.1.2.1, and 3.5.2. The unit was returned to Mode 3 at 1255 of the same day due to a secondary side leak. Both valves were repaired and determined operable on November 4, 1985.

Unit 1 was in Mode 1 at 100% power at the time of the discovery of the Technical Specifications violation on January 15, 1986. This incident is attributed to Personnel Error because Duke Power personnel determined that no Technical Specifications would be violated before the decision to startup was made.

BACKGROUND:

The NV system is composed of 3 main subsystems: 1) charging, letdown and seal water; 2) chemical control purification and makeup; and 3) standby makeup. The charging and letdown functions of the system are employed to maintain a programmed water level in the system pressurizer, thus maintaining proper reactor coolant (NC) inventory during all phases of plant operation. The NV pumps normally take suction from the VCT and return cooled, purified reactor coolant to the NC system via the charging system. During a Safety Injection (SI), the VCT is isolated from the NV pumps by an automatic closure of the two subject valves.

DESCRIPTION OF EVENT:

On November 2, 1985, at approximately 0640, a section of braided, flexible pipe on the discharge of Instrument Air (VI) compressor B ruptured at a welded seam. As a result, all VI loads (VI is a shared system) not protected by check valves experienced decreased VI pressure. The low VI pressure caused the feedwater control valves on each unit to begin to close, causing steam generator (S/G) levels to decrease. At 0641, Unit 1 experienced a reactor/turbine trip on S/G 1A low-low level. Pressurizer pressure dropped below the Safety Injection (SI) setpoint (1845 psig) initiating SI. The pressure dropped was partially due to higher than normal steam loads with some valves failing open on loss of VI. Unit 2 tripped on S/G 2A low-low level, but pressure did not decrease to the SI setpoint (LER 369/85-34).

During the Unit 1 SI, the two valves in question automatically closed to allow the NV pumps to take suction from the RWST instead of the VCT. When the SI was reset, the subject valves could not be opened from the control room so they were manually opened. Later that morning, during shift turnover, the problem with the first valve (electrically inoperable) was turned over, but the problem with the second valve (also electrically inoperable) was not. Realizing that it was a lengthy job to replace and set up the actuator for the first valve, Management personnel began a discussion to determine if start-up could continue or if the NV system should be declared inoperable. Technical Specifications were searched, and based on the erroneous assumption that neither of the

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  McGuire Nuclear Station - Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 3 6 9	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 6	0 0 3	0 0	0 3	OF 0 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

two valves was part of any required flow path, Duke Power personnel decided that no Technical Specification would be violated. Startup on Unit One continued, and a work request was written to repair the first valve.

While reviewing a computer printout later that day, Duke Power personnel discovered that the second valve was also electrically inoperable. Another work request was written to repair the second valve.

The decision to startup the Unit was based upon Duke Power personnel's determination that neither of the two valves in question is in the required flow path in Technical Specification 3.5.2. This technical specification, which addresses the operability of the NV portion of the Emergency Core Cooling System (ECCS), requires "an operable flow path capable of taking suction from the RWST on an SI signal and automatically transferring suction to the containment sump during the recirculation phase of operation". The valves in question are needed for the NV system to perform its design requirements, and the NV system should have been declared inoperable until the valves were repaired.

Unit 1 entered Mode 2 at 0615 on November 3, 1985, but it was soon discovered that a secondary side S/G leak would require cooling down the unit. Reactor shutdown was started and Unit 1 entered Mode 3 at 1255 (Unit 1 did not exceed 2% reactor power while in Mode 2). The two valves in question were repaired on November 4, 1985 while Unit 1 was still in Mode 3.

Duke Power Company is conducting an investigation of the two valve actuator failures to prevent reoccurrence of this type of incident. A search of the Nuclear Plant Reliability Data System (NPRDS) revealed no other similar failure of the valve actuators in question (Model 11NAZ, manufactured by Rotork).

A review of past Licensee Event Reports indicates that McGuire Nuclear Station has not previously experienced an incident of this nature. Therefore, this is considered an isolated incident.

CORRECTIVE ACTION:

Immediate: The two subject valves were repaired.

- Subsequent:
- 1) Duke Power Company is conducting an investigation of the valves actuator failures with assistance from Rotork Personnel.
  - 2) A letter was submitted to all Duke Power licensed operators advising them in the determination of the operability of a flow path for systems covered by Technical Specifications.
  - 3) A letter was submitted to appropriate Duke Power personnel requesting: 1) the design purpose of motor-operated valves which receive an Engineered Safety Features (ESF) signal; and, 2) the consequences of such a valve being out of its safety position and inoperable.

Planned: 1) The results of the investigation of the valve actuator failures will be covered with all appropriate Duke Power personnel.

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FACILITY NAME (1)  McGuire Nuclear Station - Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 3 6 9	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 6	0 0 3	0 0	0 4	OF 0 4

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- 2) The response to the previous letter (subsequent corrective action Number 3) will be covered with all appropriate Duke Power personnel.

SAFETY ANALYSIS:

Duke Power has completed a safety analysis to determine if operation with the two subject valves open during a small loss-of-coolant accident could render the NV pumps inoperable as the result of the VCT being depleted and its hydrogen blanket binding in the NV pumps suction lines. This analysis determined that hydrogen binding could occur 18 1/4 minutes after actuation of SI. The analysis was based on an initial VCT level of 50% and an initial pressure of 30 psi.

Duke Power instructed two different employees at different times to leave from the control room area, dress out, and go to the location of the subject valves. The two employees in question arrived at the valves in 15 minutes and 18 minutes respectively.

After the SI reset on November 2, the time difference between when the overload alarms were received and when the valves were manually opened was approximately 15 minutes. If an actual SI had occurred while these valves were inoperable, the second step on the Safety Injection procedure requires proper position verification (closed) of these valves. With control room personnel knowing these two valves were in the open position, dress out requirements could be waived and Duke Power personnel could have one valve closed in an estimated 10 minutes or less.

The two subject valves were inoperable when Unit 1 entered Mode 2 on November 3 at 0615. Work requests had been submitted and work had already begun on these valves. However, only one valve was worked on at a time, and the valve in question was gagged open while the actuator was removed. Therefore, both valves were open at all times while the actuators were replaced, and one valve was always capable of being closed manually. Furthermore, as best as can be determined, repair personnel were always at the valves during the time they were being repaired. Therefore, had another SI occurred, personnel were at the valves and could have manually closed them at the request of Operations personnel.

If hydrogen would enter the NV system and bind the NV pumps, the reactor could be shut down safely with the control rods. However, there would be no make-up to the NC system until a lower reactor coolant pressure was reached to initiate the Safety Injection pumps (approximately 1500 psig discharge pressure).

No incidents occurred which required the automatic closure of the two valves in question during the duration of this event.

The health and safety of the public were not affected by this incident.

DUKE POWER COMPANY

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VICE PRESIDENT  
NUCLEAR PRODUCTION

TELEPHONE  
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February 10, 1986

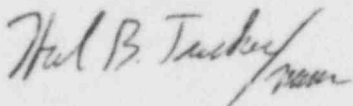
Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: McGuire Nuclear Station, Unit 1  
Docket No. 50-369  
LER 369-86-003

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (2) (IV), attached is Licensee Event Report 369-86-003 concerning Operation in Mode 2 With Both Trains of Chemical and Volume Control System in a Degraded Condition. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,



Hal B. Tucker

JGT/jgm

Attachment

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